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Postdoctoral Position Available
(Poxvirus and Vaccines Laboratory at the CNB-CSIC; Madrid, Spain)

A 2.5-year postdoctoral position is available at the Poxvirus and Vaccines Laboratory of the National Center for Biotechnology (CNB) (PIs: Juan García Arriaza and Mariano Esteban; https://poxvirusandvaccines.wordpress.com) to work in the development of novel vaccine candidates against SARS-CoV-2 and emerging viral infections. As a model system for the expression of genes of interest we use the modified vaccinia virus Ankara (MVA) strain, a member of the poxvirus family.

Project and job information: We have previously developed vaccine candidates against COVID-19 based on the MVA vector expressing the SARS-CoV-2 S protein that were highly immunogenic and effective in the control of virus infection in several animal models. We have received funding from the *Plan Estatal* of the *Ministerio de Ciencia e Innovación* (Project title: Development, immune function and efficacy of vaccine candidates against SARS-CoV-2/COVID-19 based on the poxvirus vector MVA [MVA-SARS-CoV-2]) to generate novel vaccine candidates against SARS-CoV-2, as well as to study their immunogenicity and efficacy in animal models. The goal of this project is to develop new vaccination strategies to extent the range of SARS-CoV-2 antigens, in order to stablish the best-in-class immunogens that induces more potent levels of SARS-CoV-2-specific T and B-cell immune responses, and confer the highest level of protection and of durability. These findings will generate detailed insights into the immunological mechanisms necessary for SARS-CoV-2 vaccine efficacy, relevant to vaccination programs against this and other emerging viruses, and will identify the most effective vectors that could move forward to clinical trials. The project is highly interdisciplinary and combines methods from virology, cell biology and immunology (i.e., virus generation, cell culture techniques, immunofluorescence, RT-qPCR, ELISA, flow cytometry, virus neutralization, etc.), as well as experimentation in mouse animal models.

Competences: Highly motivated postdoctoral researchers with strong interest and experience in vaccine development, virology and immunology. Motivated candidates with prior experience in recombinant virus generation, cell culture, molecular biology, immunology, BSL-3 laboratory skills, and mouse experimentation are especially encouraged to apply. A good knowledge of English and a Certificate in animal experimentation are highly desirable.

Start date: May 2023.

Contact: Interested candidates should submit a cover letter and a CV to Juan García Arriaza (jfgarcia@cnb.csic.es) and Mariano Esteban (mesteban@cnb.csic.es).

Relevant publications from the group in the last 2 years:

- García-Arriaza, J., Garaigorta, U., Pérez P., Lázaro-Frías A., Zamora C., Gastaminza P., Del Fresno C., Casasnovas J.M., Sorzano C.Ó.S., Sancho D. & Esteban M. COVID-19 vaccine candidates based on modified vaccinia virus Ankara expressing the SARS-CoV-2 spike protein induce robust T- and B-cell immune responses and full efficacy in mice. Journal of Virology, 95 (7): e02260-20 (2021).

- Del Fresno, C., García-Arriaza, J., Martínez-Cano, S., Heras-Murillo, I., Jarit-Cabanillas, A., Amores-Iniesta, J., Brandi, P., Dunphy, G., Suay-Corredera, C., Pricolo, M.R., Vicente, N. López-Perrote, A., Cabezudo, S., González-Corpas, A., Llorca, O., Alegre-Cebollada, J., Garaigorta, U., Gastaminza, P., Esteban, M. & Sancho, D. The bacterial mucosal immunotherapy MV130 protects against SARS-CoV-2 infection and improves COVID-19 vaccines immunogenicity. Frontiers in Immunology, 12:748103 (2021).

- Lázaro-Frías, A., Pérez, P., Zamora, C., Sánchez-Cordón, P., Guzmán, M., Luczkowiak, J., Delgado, R., Casasnovas, J.M., Esteban, M. & García-Arriaza, J. Full efficacy and long-term immunogenicity induced by the SARS-CoV-2 vaccine candidate MVA-CoV2-S in mice. NPJ Vaccines, 7 (1):17 (2022).

- Pérez, P., Lázaro-Frías, A., Zamora, C., Sánchez-Cordón, P., Astorgano, D., Luczkowiak, J., Delgado, R., Casasnovas, J.M., Esteban, M. & García-Arriaza, J.#. A single dose of an MVA vaccine expressing a prefusion-stabilized SARS-CoV-2 spike protein neutralizes variants of concern and protects mice from a lethal SARS-CoV-2 infection. Frontiers in Immunology, 12:824728 (2022).

- Mooij, P., García-Arriaza, J., Pérez, P., Lázaro-Frías, A., Verstrepen, B.E., Böszörményi, K.P., Mortier, D., Fagrouch, Z., Kiemenyi-Kayere, G., Niphuis, H., Acar, R.F., Meijer, L., Stammes, M.A., Kondova, I., Verschoor, E.J., GeurtsvanKessel, C.H., De Bruin, E., Sikkema, R.S., Luczkowiak, J., Delgado, R., Montenegro, D., Puentes, E., Rodríguez, E., Bogers, W.M.J.M., Koopman, G. & Esteban, M. Poxvirus MVA expressing SARS-CoV-2 S protein induces robust immunity and protects rhesus macaques from SARS-CoV-2. Frontiers in Immunology, 13:845887 (2022).

- Boudewijns, R., Pérez, P., Lázaro-Frías, A., Van Looveren, D., Vercruysse, T., Thibaut, H.J., Weynand, B., Coelmont, L., Neyts, J., Astorgano, D., Montenegro, D., Puentes, E., Rodríguez, E., Dallmeier, K., Esteban, M. & García-Arriaza, J. MVA-CoV2-S vaccine candidate neutralizes distinct variants of concern and protects against SARS-CoV-2 infection in hamsters. Frontiers in Immunology, 13:845969 (2022).

- Pérez, P., Astorgano, D., Albericio, G., Flores, S., Sánchez-Cordón, P.J., Luczkowiak, J., Delgado, R., Casasnovas, J.M., Esteban, M. & García-Arriaza, J. Intranasal administration of a single dose of MVA-based vaccine candidates against COVID-19 induced local and systemic immune responses and protects mice from a lethal SARS-CoV-2 infection. Frontiers in Immunology, 13:995235 (2022).

- Villadiego, J., García-Arriaza, J., Ramírez-Lorca, R., García-Swinburn, R., Cabello-Rivera, D., Rosales-Nieves, A.E., Álvarez-Vergara, M.I., Cala-Fernández, F., García-Roldán, E., López-Ogáyar, J.L., Zamora, C., Astorgano, D., Albericio, G., Pérez, P., Muñoz-Cabello, A.M., Pascual, A., Esteban, M., López-Barneo, J., & Toledo-Aral, J.J. MVA-CoV2-S vaccine candidate confers full protection from SARS-CoV-2 brain infection and damage in susceptible transgenic mice. Nature Neuroscience, 26 (2):226-238 (2023).